Another very interesting fact brought out by the author's work on sweet potatoes is the apparent stability of cane sugar in relation to the respiratory processes in these roots, as cane sugar does not seem to be consumed by either anaërobic or normal respiration.—CHARLES O. APPLEMAN.

Analysis of quantitative variation.—BROTHERTON and BARTLETT[12] have presented the results of a very significant piece of research. The investigation as it stands belongs to the field of plant physiology, but probably it is most significant in the bearing upon certain problems of genetics. Plants of *Phaseolus multiflorus* grown in light and darkness were compared as to length and number of epidermal cells of a given internode. For the physiologist the results may be summarized in the following statement: "The effect of light is that it retards extension of the cells, and that as an indirect result there are fewer secondary divisions, since relatively fewer primary cells enter the range of length within which division takes place." For the geneticist we quote the following: "The mathematical formulation of the results of size inheritance according to the multiple factor hypothesis should be paralleled by a biological analysis, the object of which is the identification of the several factors concerned." Thus size differences may be resolved into number or size of constituent cells or both. "In the investigation of quantitative variations of a hereditary nature it seems likely that the study by the histological method of reactions to the environment and of the obscure reaction known as 'vigor of heterozygosis' will afford a means of correcting for these disturbing factors." It is probably true that heritable size differences express themselves directly in the cells of tissues deeper than the epidermis, and that the change in the epidermis amounts merely to a mechanical response to these forces within. It would probably be advisable, therefore, to carry the analysis to more significant tissues.—MERLE C. COULTER.

Root growth in cuttings.—CURTIS[13] has published an important contribution to the physiology of root formation in cuttings. A number of forms were used, but *Ligustrum ovalifolium* furnished most of the experimental material. Nutrient solutions of the strengths used in culture work with seedlings were found to be distinctly injurious to woody cuttings. Treatments with potassium permanganate resulted in a very marked increase in root growth of various woody cuttings. After discussing several possible explanations for this stimulation, the author concludes that it is most probable that the potassium permanganate increases respiratory activity by catalytically hastening oxidation. It is known that when potassium permanganate comes in contact with organic matter manganese dioxide is precipitated and oxygen is liberated. There was

[12] BROTHERTON, WILBER, and BARTLETT, H. H., Cell measurement as an aid in the analysis of quantitative variation. Amer. Jour. Bot. 5:192–206. 1918.

[13] CURTIS, OTIS F., Stimulation of root growth in cuttings by treatment with chemical compounds. Cornell Univ. Agric. Exper. Sta. Memoir 14:71–138. 1918.

some indication that other inorganic compounds may stimulate root growth in cuttings. The author's work gives further strong evidence that callus and root growth is independent of the rest period and that only the buds assume the resting condition. Immature twigs were caused to absorb cane sugar which increased root development. Mature twigs, however, were but slightly benefited. When the base of cuttings were placed in sugar solution for a short time, the terminal bud of the twig failed to develop in a normal manner and the lower buds formed shoots instead. The author believes that many of the practices commonly followed by greenhouse and nursery men in the propagation of plants by cuttings are explainable on the basis of better aëration. The discussions of the literature are comprehensive and critical.—CHARLES O. APPLEMAN.

Vegetation of Newfoundland.—In contrasting the divergent floras of different parts of Newfoundland, FERNALD[14] bases his explanation of their differences upon the hypothesis that "the presence or absence of varying degrees of available lime or of other bases in the soil is more fundamental in determining plant distribution than are even considerable differences of temperature and humidity."

The calcareous and at the same time the most fertile portion of the island is along the west shore, where the ordinary observer would be surprised to find the indigenous flora of the warmest and most fertile region of the island composed very largely of species of high northern distribution, such as *Juncus triglumis*, *Saxifraga oppositifolia*, *S. aizoides*, *S. caespitosa*, *Salix vestita*, *Dryas integrifolia*, and *Lesquerella arctica*. These FERNALD explains as being from the calcareous habitats of the arctic archipelago and the Canadian Rockies, the lime being hostile to the plants of the siliceous adjacent mainland. The eastern part of the island, the central tundra district, and the southwest corner, in spite of the fact that they are cold, bleak, and barren, are populated mainly by plants of the southern Atlantic coast region, with an addition of some like *Calluna vulgaris* and *Pedicularis sylvatica* from the acid soils of western Europe.

Maps of the distribution of a dozen species give graphic demonstration of the remarkable distribution of some of the more important plants and serve to make the evidence in the support of his hypothesis the more convincing.—GEO. D. FULLER.

Physiological rôle of glucosides in plants.—Continuing his investigations on the physiological rôle of glucosides in plants, COMBES[15] has made the interesting discovery that a given glucoside is not toxic to a plant which naturally

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[14] FERNALD, M. L., The contrast in the floras of eastern and western Newfoundland. Amer. Jour. Bot. **5**:237–247. *pls. 3.* 1918.

[15] COMBES, RAOUL, Recherches biochemiques experimentales sur le rôle physiologique des glucosides ches les vegetaux. Rev. Gen. Botanique **30**:226–237, 245–257. 1918.